

# Logging Practices

## Introduction

In the Play+ ecosystem, we believe developer tools should be invisible until needed—frictionless by default, powerful when required. This helper is based on the concept of structured, environment-aware logging.

Effective logging is crucial for observability, debugging, and understanding user behavior. The playlog helper provides a zero-setup, unified API for capturing application events. This aligns with our core design pillars by making development more Intuitive (a simple API abstracts complexity), our systems more Adaptive (clear logs help us respond to issues faster), and our codebase more Distinct (a consistent logging approach across all projects).

## Package Info

The Play+ logging helper is provided via the `@playplus/logging` package and is included by default in the Golden Path starter kit.

## Description

| Package / Path | Golden Path (Recommended)                  |
|----------------|--|
| Pre-installed  | <code>/system/play.log.ts</code>           |
| Uplift Path    | <code>npm install @playplus/logging</code> |

## Folder Reference

The logging helper and its configuration follow our standardized folder structure for core system logic.

| File / Directory                | Purpose & Guidelines   |
|---------------------------------|--|
| <code>system/play.log.ts</code> | The core logging service. It abstracts the underlying logging library (e.g., Pino) and handles all formatting. |

| File / Directory            | Purpose & Guidelines   |
|-----------------------------|--|
| config/play.log.config.json | User-overridable configuration for log levels, PII redaction, and log transport (where logs are sent). |
| .env                        | Environment-specific variables, which can override settings in the config file.                        |

## Helper - Pillars Alignment

The playlog helper is a foundational tool that reinforces our core design pillars.

| Pillar    | How This Helper Aligns  |
|-----------|---|
| Intuitive | Primary Pillar: Replaces the complexity of logging libraries with a simple, memorable API ( <code>info</code> , <code>warn</code> , <code>error</code> ). |
| Adaptive  | Automatically adjusts its output and transport based on the environment (e.g., pretty-prints in dev, sends JSON in prod).                                 |
| Distinct  | Ensures a consistent structure and format for all log outputs across all Play+ applications, creating a unified signal.                                   |

## Helper Overview

The playlog helper is your single, unified interface for all application logging. Its purpose is to abstract the plumbing of a production-grade logging system. Developers don't need to worry about log formatting, timestamps, redaction, or routing; they just need to call the appropriate method.

Behind the scenes, the helper automates everything:

- Structured Formatting : In production, it formats logs as JSON, ready for ingestion by services like Datadog or Sentry.
- Pretty Printing : In development, it formats logs in a human-readable, colorized way.

- Automatic Enrichment : It automatically injects context like timestamps, hostname, and application name into every log entry.
- PII Redaction : It automatically scrubs sensitive data (like passwords and tokens) based on your configuration, before the log is ever written.
- Environment-Aware Transport : It logs to the console in development but can be configured to send logs to a remote service in production.

This means a developer can simply call `playlog.info()` and trust that the system is doing the right thing for the current environment.

## Config Options

Global configuration is managed in `config/play.log.config.json` and can be overridden by environment variables.

## Configuration Priority

The `playlog` helper determines the active log level using the following priority order:

- Environment Variable : Highest priority. A variable like `LOG_LEVEL=debug` in your `.env` file or CI/CD environment will always take precedence. This is ideal for temporary debugging.
- `play.log.config.json` file : The project-wide default setting. This is the recommended place to set the standard for your environments.
- Built-in Default : If neither of the above is set, the helper falls back to its own internal default, which is "info" .

## Configuration Details

| Config Variable | Default Value | Description   | Recommended Value                 |
|-----------------|---------------|---|-----------------------------------|
| level           | "info"        | The minimum level to log. In order of verbosity: debug , info , warn , error . Can be overridden by <code>LOG_LEVEL</code> env var. | "debug" in dev,<br>"info" in prod |

| Config Variable  | Default Value                          | Description   | Recommended Value            |
|------------------|--|---|------------------------------|
| redact           | ["password", "token", "authorization"] | An array of object keys whose values will be masked (e.g., "[REDACTED]"). Uses partial matching.            | Add any custom PII keys      |
| transport.type   | "console"                              | Where to send logs. "console" for stdout, "remote" to send to a URL.  | "remote" in production       |
| transport.apiUrl | null                                   | If type is "remote" , this is the endpoint where logs will be sent via a POST request.                      | Your log ingestion URL       |
| transport.apiKey | null                                   | An optional API key to be sent in the Authorization header for remote transport. Use environment variables. | Your logging service API key |

## Helper Methods

## Recommended Methods

For clarity, readability, and best practice, we recommend using these level-specific methods. They make your intent clear and allow for easy filtering in logging platforms.

| Method Name | What It Does  | Method Signature  |
|-------------|---|---|
| debug       | Logs a verbose message, useful for development and deep debugging. Hidden in production by default. | debug(message: string, context?: object): void                |
| info        | Logs an informational message, such as a user action or system event.                               | info(message: string, context?: object): void                 |
| warn        | Logs a warning about a potential issue that doesn't prevent the application from working.           | warn(message: string, context?: object): void                 |
| error       | Logs an error, typically with an Error object to capture its stack trace and other details.         | error(error: Error, message?: string, context?: object): void |

## Universal Method

The add method provides a flexible, "one-call-to-log-them-all" interface. It intelligently determines the log level based on the arguments provided. While powerful, the level-specific methods above are preferred for readability.

| Method Name | What It Does  | Method Signature  |
|-------------|---|---|
| add         | A universal logging method that handles simple messages, contextual logs, and errors intelligently. | add(messageOrError: string   Error, context?: object, message?: string): void |

## Usage Examples

### React: Component Lifecycle and User Interaction

### Angular: Service-Level Logging

## Additional Info

### Why We Created This Helper

Without a centralized logging helper, developers often default to using `console.log` , which has major drawbacks: it's unstructured, has no severity levels, cannot be configured for different environments, and reveals sensitive information in production. Setting up a proper logging library like Pino or Winston from scratch is complex and requires significant boilerplate.

The playlog helper solves this by providing a production-ready logging system out of the box. It abstracts away all the configuration and formatting, allowing developers to add meaningful, secure, and structured logs with a single line of code.

## Best Practices

- Log What, Not How : Log significant events ("User created") rather than implementation details ("Function `createUser` was called").
- Log at the Right Level : Use error for actual errors, warn for potential issues, info for key events, and debug for temporary development tracing.
- Always Provide Context : A log message like "API failed" is useless. "API failed", { endpoint: '/users', status: 500 } is invaluable.
- Pass Full Error Objects : Always log the actual Error object in `playlog.error()` to automatically capture stack traces.
- Don't Log PII : Trust the redaction system, but avoid logging sensitive data in the first place where possible.

## Developer Checklist

- Is my log message clear and concise?
- Have I included relevant context (like a `userId` or `requestId` )?
- Am I using the correct log level ( `info` , `warn` , `error` )?
- For errors, am I passing the Error object to `playlog.error()` ?
- Have I double-checked that I'm not logging any sensitive information that isn't covered by the global redaction config?